

GNEISS-CHARNOCKITE-GRANITE CONNECTION IN THE
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The Peninsular gneissic complex of tonalite-trondhjemite-granite composition unconformably underly the Proterozoic platformal and geosynclinal Dharwar Supracrustal succession in Karnataka Craton of Southern Indian shield. Isotopic work and geochemical considerations indicate that the Peninsular gneiss components of central and southern Karnataka Craton were generated by mantle-derived magmas between 3200-3000 Ma [1]. The Pb-isotopic and U-Th element compositions reveal that conditions of extreme granulite grade metamorphism were not attained at the time of Archaean crust emplacement in the craton. However, the uplifted deep-level high pressure "massif" charnockites of B.R. Hills severely depleted of U, Th, Pb and Rb [2] indicate conditions of extreme granulite grade metamorphism attained. Halagur charnockites recording high-pressure conditions of granulite grade metamorphism [3] presumably an extension of B.R. Hills charnockites yield Rb/Sr whole-rock isochron age of 2845 Ma with an initial ratio of 0.7040. This early metamorphic event does not coincide with Archaean crust forming event in the craton but coincides with U-Pb date of 2844 Ma recorded by the zircons separated from Kabbaldurga charnockite from the transition zone at the southern end of the Closepet granite [4].

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The Closepet granite, the largest linear batholith in the craton geochemically similar to Kabbaldurga granitic charnockite is reported to be formed by 20 percent batch melting of tonalite charnockite source that contained hornblende and garnet [5].

A close examination of Peninsular gneiss quarries of Bangalore in eastern Karnataka show evidence for the inclusions of unmodified "exploded" older migmatite gneiss enclaves within the homogeneous weakly foliated penetrative younger granites. The gneissic enclaves yield Rb/Sr whole-rock isochronage of 2950 Ma with initial ratio of 0.7057. The younger intrusive granites which host these older gneiss enclaves record Rb/Sr whole-rock isochron age around 2600 Ma with initial ratios 0.7010 to 0.7032 indicating an anomalous mantle or depleted crustal source for the granites [6]. It is interesting to note that biotites separated from the gneiss enclaves yield Rb/Sr mineral date close to 2600 Ma while those from the younger granites record close to 2300 Ma the late thermal events recorded in the gneissic terrain of Bangalore.

References

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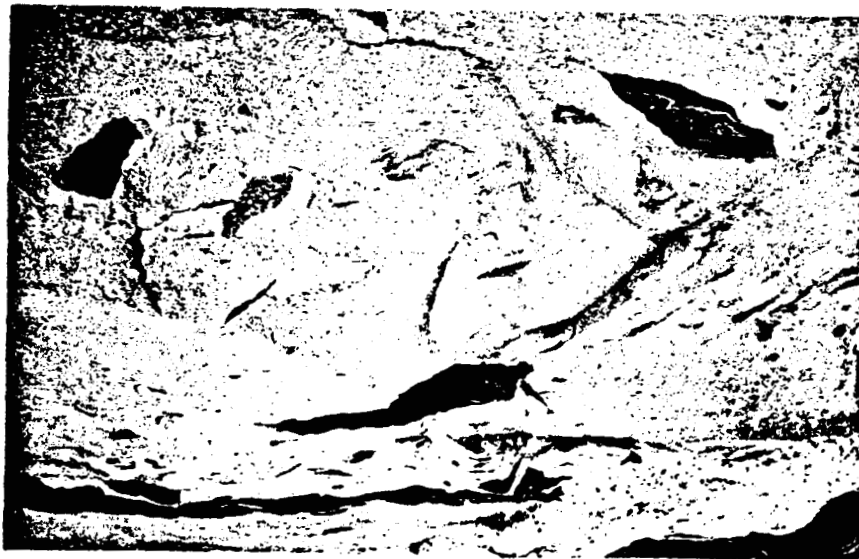
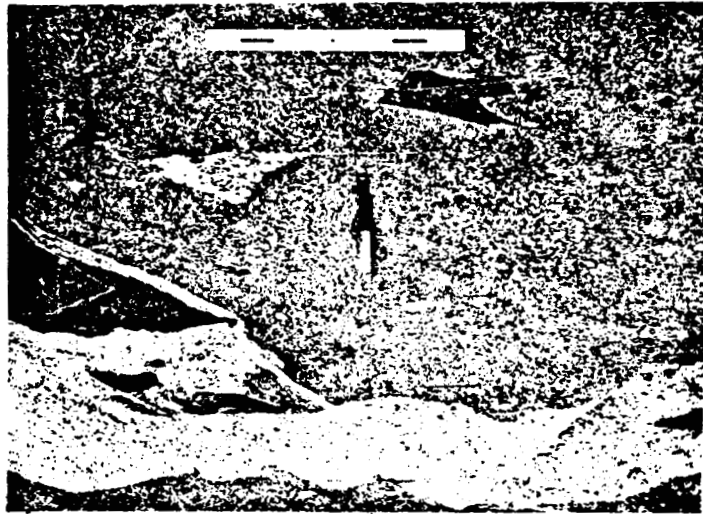


Fig. 2950 Ma old migmatite enclaves in 2600 Ma intrusive granites, Bangalore gneiss quarries.

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